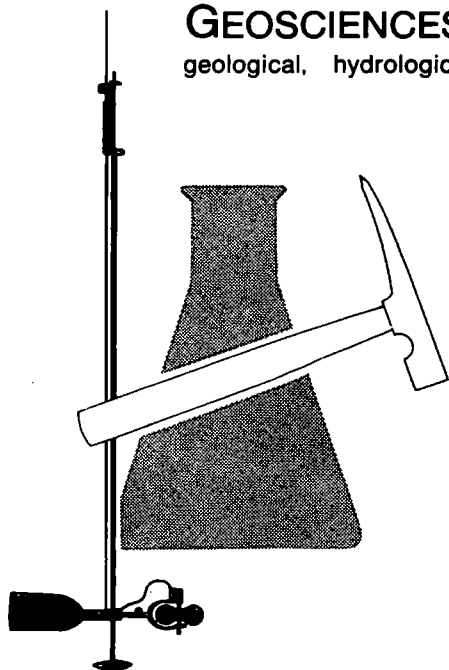


**GEOSCIENCES RESEARCH ASSOCIATES, INC.**  
geological, hydrological, geotechnical and environmental consulting



US EPA RECORDS CENTER REGION 5



1000709

**Keystone Steel and Wire Company**  
**Health and Safety Plan**

September, 1988

**GEOSCIENCES RESEARCH ASSOCIATES, INC.**  
627 N. Morton Street    Bloomington, Indiana 47404  
(812)336-0972

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SITE HEALTH AND SAFETY PLAN  
Keystone Steel and Wire Company

1.0 SITE DESCRIPTION

Keystone Steel and Wire Company is located in Bartonville, Illinois just east of U.S. Route 24 and approximately one mile west of the Illinois River. Keystone lies in the east half of Section 25 and the northeast quarter of Section 36 of Township 8 North, Range 7 East. The site is characterized by low relief (about ten feet) at elevations of about 450 and 460 feet M.S.L. Keystone is bounded on the northeast by Interstate 474 and on the south by marsh and swamp land on the Illinois River floodplain.

The Keystone complex is divided into two major areas by the Chicago and Northwestern railroad grade. The Steel Works are located to the east of this grade while the Wire Mill is to the west.

The results of previous sampling events showed several organic contaminants in the ground water in the vicinity of the Wire Mill. The contaminants of primary concern regarding health and safety are trichloroethene (TCE) and compounds commonly related to the biodegradation of TCE.

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## 2.0 PROJECT OBJECTIVES AND SCOPE OF WORK

The objectives of this Remedial Investigation (RI) are to:

1.) Determine the source(s) of TCE contamination, 2.) Predict the direction and rate of migration of TCE contamination, 3.) Obtain adequate information on TCE concentration levels to conduct a hazard assessment, including the identification of potential ecological and human receptors, and 4.) Develop and screen preliminary remedial actions.

The scope of work for the RI includes: 1.) Conducting geophysical studies to obtain resistivity profiles, 2.) Installing monitoring wells and analyzing subsurface soil samples obtained during these operations, 3.) Collecting and analyzing ground water samples during monitoring well installations and after wells are completed (two sampling rounds), 4.) Aquifer testing, 5.) Monthly water level measurements.

## 3.0 ONSITE PERSONNEL

The following personnel will be present during all or part of the RI operations:

Project Manager: Robert Aten

Project Hydrogeologist: John Bassett

Project QAM: James Keith

Project Safety Officer/Assistant QAM: Beth Sluys

Project Chemist: Daryl Schulz

Project Field Geologists: Martin Lytle, Ken Gill

Keystone Representative (may be present)

IEPA Representative (may be present)

Drilling Contractor Personnel

Geophysics Contractor Personnel

All field personnel involved in drilling and sampling operations will have had a minimum of 40 hours of safety training in accordance with 29 CFR 1910.120(e)(2). All onsite personnel shall read and sign this Health and Safety Plan prior to initial work site entry to insure that proper safety protocol is understood and followed. All personnel involved in drilling operations will have undergone physical examinations prior to arrival at Keystone. Documentation concerning the results of these physicals will be required and kept on file in the office/lab trailer on site.

#### 4.0 ONSITE CONTROL

The onsite field office will be in the office/lab trailer located within the fence near the retention reservoir at the WWTP. Personnel will log in and out at the office/lab trailer prior to entering or exiting work sites at the start and completion of each work day. No smoking will be permitted in the office/lab trailer due to sensitive laboratory equipment.

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#### 4.1 Monitoring Well Installation/Subsurface Soil Sampling

During all drilling operations, the Exclusion Zone will be an area of approximately 30 feet in diameter surrounding the drill rig when possible. Only personnel involved with drilling and related operations will be allowed in this area. For Level C and B activities, workers in the Exclusion Zone should be in line-of-site contact with backup personnel in the Support Zone.

The Contamination Reduction Zone will be located between the Exclusion Zone and the Support Zone and will contain a decontamination area for contaminated equipment and personnel. Decontamination shall take place prior to entering the Support Zone.

The Support Zone should be in an upwind direction from the drilling operations. There will be a wind direction indicator at each work site, located so they are readily visible to all personnel. Support personnel should stay upwind of the Exclusion Zone when possible.

Boundaries for these zones will be delineated and explained to all personnel authorized to be on site. Smoking will not be permitted in the Exclusion Zone.

A brief organizational meeting will be conducted each morning prior to initiating any site activities. The purpose of

these meetings will be to announce any changes in the Site Safety Plan, coordinate activities, and to get worker feedback on overall field operations.

## 5.0 HAZARD EVALUATION

The following substances were detected in the ground water (based on the May 1988 sampling results):

<u>CHEMICAL</u>	<u>CONCENTRATION (ug/L)</u>
Trichloroethene	6 - 790
Vinyl Chloride	13
Chloroethane	150
Methylene Chloride	6 - 350
Acetone	14 - 33
2-Butanone	23 - 27
1,1-Dichloroethene	6 - 830
1,1-Dichloroethane	6 - 2100
1,2-Dichloroethene	8 - 20
1,1,1-Trichloroethane	8 - 700

Hazardous substance information forms for these compounds are shown in Appendix A.

## 6.0 PROTECTION LEVELS AND PERSONAL PROTECTIVE EQUIPMENT

### 6.1 Explanation of Protection Levels

Level D: Work clothes and/or cotton coveralls, steel toe boots, possibly hardhats or as otherwise specified for a given task.

Level C: Saranex-tyvek coveralls, full face air purifying respirator (APR) with organic vapor canisters, rubber steel toe boots, nitrile gloves with liners, hardhat, and possibly faceshield, depending on splash potential.

Level B: Saranex-tyvek coveralls, self contained breathing apparatus (SCBA), steel toe rubber boots, nitrile gloves with liners, hardhat, and possibly faceshield, depending on splash potential.

The levels of protection recommended in this plan are based on previously compiled data. If any significant changes in site conditions develop, this plan will be reviewed and changes made accordingly. The following levels of protection have been designated for the various tasks to be performed:

### 6.2 Geophysical Studies

Exposure to chemically hazardous materials during the resistivity study is unlikely. During the resistivity study,



the primary health and safety concerns will be physical hazards such as stockpiled wire products, raw manufacturing materials, and traffic, especially in the Mid Mill and Steel Works areas. Because of the low hazard level involved with this task, normal workclothes will be required including hardhats and steel toe boots.

### 6.3 Monitoring Well Installation/Subsurface Soil Sampling

Level D protective gear will be worn initially during drilling operations with continual environmental monitoring. If monitoring efforts show organic vapor levels ranging from 2-5 ppm above background in the ambient air, the protection level will be upgraded to Level C with continual monitoring.

Contaminated cuttings produced during drilling will be drummed immediately to avoid excessive organic vapor production in the drilling area.

Level B protective gear will be necessary if organic vapor levels increase to constant levels above 5 ppm. In the event that Level B equipment becomes necessary in the Exclusion Zone, a pre-designated person in the Support Zone should be prepared to go to Level B as a backup in case of emergency. If the oxygen level in the work area around the bore hole falls below 19.5%, Level B protection will be maintained. Oxygen

measurements are of particular importance in low lying areas and in the vicinity of the bore hole due to the possibility of heavier than air vapors being produced.

Personnel in the Support Zone and the field geologist should be notified of any changes in protection levels taking place in the Exclusion Zone. If the soil samples are heavily contaminated, it may be necessary for the field geologist to wear an APR and nitrile gloves while logging soil samples.

If combustible gases or vapors are detected near or above 10% of the lower explosive limit (LEL), extreme caution should be exercised in continuing the investigation. If readings approach or exceed 25% LEL, personnel in the Exclusion Zone should be withdrawn immediately.

#### 6.4 Ground Water Sampling

Two rounds of sampling will occur after all monitoring wells are installed. Protection levels necessary during sampling will be dependant on the results of the preliminary soil and water analyses. The wells will be monitored for organic vapor production prior to sampling. As a precaution, samplers should stand upwind of the well and care should be taken to avoid splashing during purging and sampling operations.

## 6.5 Aquifer Testing

Because pneumatic methods will be used during the slug tests, there will be slight chance of exposure to potentially contaminated ground water. The pump tests will be conducted using piezometer wells and the Keystone deep pumping wells. Ground water from these deep wells has been analyzed and does not pose a hazard. Due to the slight chance of exposure to potentially contaminated ground water, the protection level necessary during these tasks will be Level D.

## 6.6 Monthly Water Level Measurements

Monthly water level measurements will be conducted in normal work clothes and steel toe boots.

## 6.7 Equipment Failure

If any site worker experiences a failure or alteration of protective equipment that affects the protection factor, that person shall immediately leave the Exclusion Zone. Reentry will only be allowed with repaired or replaced equipment.

## 7.0 DECONTAMINATION PROCEDURES

Decontamination procedures are dependant upon the level of protection, work activities, and the degree and type of contamination involved. Equipment used for each protection level is discussed in Section 6.1.

### 7.1 Level D

If boots are not heavily contaminated, dry decon with a brush is sufficient

Nitrile gloves will be worn while washing and rinsing all equipment

Rinse boots in pre-wash, step to wash tub, scrub boots with brush, step to next tub, rinse

### 7.2 Level C

Deposit field equipment (tools, clipboards, etc.) on plastic drop cloth

Nitrile gloves will be worn while washing and rinsing all equipment

Wash outer gloves and rinse

Remove tape around gloves and boots and place in a plastic lined container

Check Saranex-tyvek coveralls for punctures or tears remove and dispose of if necessary; otherwise wash coveralls and rinse thoroughly

Pre-wash boots

Wash boots, rinse

Remove coveralls, air dry

If coveralls and boots are not heavily contaminated, dry decon with a brush is sufficient

Remove facepiece, avoid touching face with gloves

Remove boots, air dry

Remove gloves and place in a plastic lined container

### 7.3 Level B

Deposit field equipment (tools, clipboards, etc.) on plastic drop cloth

Check Saranex-tyvek coveralls for tears or punctures and remove and dispose of if necessary; otherwise wash coveralls, boots, and gloves; wash the SCBA unit, if necessary; care should be taken to cover the SCBA regulator with plastic to avoid getting it wet

Remove tape around boots and gloves and place in a plastic lined container

Remove backpack and place on plastic drop cloth, leave on facepiece

Remove coveralls if not already disposed of and place in a plastic lined container

Remove facepiece, avoid touching face with gloves

Remove boots

Remove gloves and place in a plastic lined container

#### 8.0 EMERGENCY PROCEDURES

THERE WILL BE A RADIO IN THE SUPPORT ZONE. BE SURE THE RADIO IS TUNED TO F1 FREQUENCY TO NOTIFY THE GUARD STATION OF THE NEED FOR AN AMBULANCE. IF NEAR A PHONE, DIAL 911 TO GET AN AMBULANCE. GIVE YOUR LOCATION AND THE CONDITION OF THE INJURED

PERSON(S), DO NOT END COMMUNICATION UNTIL 911 OPERATOR OR SECURITY GUARD CONFIRMS YOUR LOCATION. IMMEDIATELY NOTIFY THE PROJECT MANAGER IN THE EVENT OF AN ACCIDENT.

There will be at least one person at the work site that has been trained in CPR and Emergency First Aid. Melinda Henderson of the Methodist Medical Hospital in Peoria was contacted and briefed on the work situation and the potential hazards involved. The hospital is located at 221 N.E. Glen Oak Avenue, Peoria and the Emergency Services number is (309) 672-5500. A map of the hospital location will be posted in the office/lab trailer by the phone.

In emergency situations, the Keystone guard station should be radioed and instructed to call an ambulance and the Methodist Medical Hospital. The guard station and the medical facility should be notified of site activities at least one day prior to the start of operations.

General first aid equipment will be available in the Support Zone: First Aid Kit and Eyewash and Body Drench.

#### 8.1 Personnel Injury in the Exclusion Zone

If possible, move injured person to the edge of the Exclusion Zone and evaluate the nature of the injury. If the injured person is contaminated, they should be decontaminated.

as best as possible and moved to the Support Zone only if movement is absolutely necessary to avoid further harm. If a minor injury is involved, first aid may be administered by a qualified person. If necessary, contact the guard station for an ambulance. If a neck injury is suspected, do not move the injured party until the ambulance arrives. Try to keep the injured person as warm and comfortable as possible.

## 8.2 Personnel Injury in the Support Zone

The nature of the injury should be evaluated. First aid may be administered in the field by qualified personnel. If necessary, contact the guard station for an ambulance.

## 8.3 Heat Stress

Because workers in the Exclusion Zone may be required to wear safety gear, the chances of heat stress during the summer months are greatly increased. Monitoring of personnel in protection level C or B shall commence if the ambient temperature is above 70 degrees Fahrenheit. Heart rates should be measured for 30 seconds at the start of the rest period. The heart rate at the beginning of the rest period should not exceed 110 beats per minute. If the rate is higher, shorten the work period by 10 minutes.



Body temperature should be measured at the beginning of the rest period. This temperature should not exceed 99.7 degrees Fahrenheit. If it does, shorten the next work period by 10 minutes. Body fluids should be maintained at a constant level during the work day.

#### 8.3.1 Heat Related Problems

**Heat Cramps:** Caused by excessive perspiration and inadequate fluid intake. **Symptoms:** Muscle spasms and pain in the extremities and abdomen. Have the person rest and drink fluids, monitor heart rate and body temperature.

**Heat Exhaustion:** Caused by increased stress on various organs due to increased demand to cool the body. **Symptoms:** Shallow breathing, pale, cool, moist skin, profuse sweating, and dizziness. Have the person rest and drink fluids, monitor heart rate and body temperature.

**Heat Stroke:** Severe heat stress. **BODY MUST BE COOLED IMMEDIATELY TO PREVENT SEVERE INJURY AND/OR DEATH.** **Symptoms:** Skin red, hot, and dry, no perspiration, nausea, dizziness, rapid heart rate, and confusion. **TO OBTAIN MEDICAL HELP IMMEDIATELY: RADIO THE GUARD STATION USING F1 FREQUENCY.**

#### 8.4 COLD EXPOSURE

Cold injuries such as frostbite, hypothermia, and impaired ability to work are concerns when working in low temperatures and when there is a extreme wind-chill factor. To guard against these factors, appropriate clothing should be worn and a warm shelter readily available to field personnel.

#### 9.0 ENVIRONMENTAL MONITORING

The following instruments will be used to monitor ambient conditions during onsite operations:

HNU/PID

Combustible Gas Meter

Oxygen Meter

Environmental monitoring will be conducted during drilling and sampling with the measurements recorded in the field.

Initial background levels should be taken for use with the HNU meter. Protection level changes will be determined based on monitoring data and are discussed in Sections 6.3 - 6.5.

## 10.0 COMMUNICATION PROCEDURES

Channel F1 has been designated as the radio frequency for emergency purposes to contact the Keystone guard station. All other onsite communications will use channel F2.

## 11.0 RESPIRATORY PROTECTION

Air monitoring will be conducted primarily in the Exclusion Zone of each work site especially in the area of the bore hole. All on site personnel will be prepared to wear a respirator should it become necessary.

Because all field personnel will have had the 40 hours of required safety training, they should all be familiar with the proper use and maintenance of respiratory protection equipment.

Each field person will be fit tested with an assigned respirator that they will be responsible for maintaining. Clean respirators will be stored in sealable plastic bags without canisters. Routinely used respirators will be inspected after each use and canisters replaced on a regular basis.

A portable oxygen unit will be available in the event that someone is overcome by fumes or vapors or in other emergency conditions. At least one person on site will be instructed in the use of the portable oxygen unit and will be trained in CPR in the event that emergency resuscitation is necessary.



## INSTRUCTIONS FOR SCOTT TWIN CARTRIDGE RESPIRATORS MODELS 64 and 65

### DESCRIPTION

The Scott Twin Cartridge Respirator, (hereafter called Respirator), consists of a facepiece with a pair of chemical cartridges, filters or cartridge/filter combinations as required by the specific protection needed.

The facepiece may be either a full facepiece (Model 65), providing eye protection in addition to respiratory protection, or a half facepiece (Model 64). Full facepieces are supplied in large or small sizes. Half facepieces are supplied in large, medium, or small sizes with a choice of neoprene or elastic head straps.

### LIMITATIONS AND WARNINGS

Read and understand the following instructions, the complete respirator label and the IMPORTANT WARNINGS packaged with each type of cartridge.

Twin Cartridge Respirators SHALL NOT be used for fire fighting.

Cartridges or filters DO NOT SUPPLY OXYGEN. Do not use in atmospheres containing less than 19.5% oxygen by volume.

Do NOT use where the contamination level is immediately dangerous to life or health.

Respirators labeled for protection against airborne particles only should not be used for gases/vapors. Respirators labeled for protection against gases/vapors only should not be used for airborne particles. Always read cartridge labels prior to use and be certain that you have cartridges and/or filters that will provide the required protection.

A respirator must be properly fitted to the individual to ensure proper protection. Facepiece fitting is the user's responsibility.

Respirators should not be worn when conditions such as a growth of beard, sideburns, a skull cap or temple pieces on corrective glasses prevent a good face seal with either the full or half facepiece.

Contact lenses should not be worn while wearing a respirator.

If you sense any of the following danger signals, IMMEDIATELY GET INTO FRESH AIR. (Your cartridge or filter may be used up, or abnormal conditions may be creating vapor concentrations which are beyond the limit of your respirator):

- you smell or taste chemicals, or if your eyes, nose, or throat become irritated;
- it becomes difficult to breathe;
- the air you are breathing becomes uncomfortably warm;
- you feel like vomiting or become dizzy.

### FACEPIECE FITTING

#### A. Qualitative Leak Check:

1. Attach Scott Twin Cartridges approved for protection against organic vapors.
2. Don facepiece following prescribed procedures in "Donning Procedures" section.
3. Use Scott Fit-Check ampoules, P/N 802817-01, and follow instructions on ampoule carton.  
**CAUTION: UNDER NO CIRCUMSTANCES SHOULD CARTRIDGES USED FOR LEAK CHECKING BE USED FOR ENTRY INTO A CONTAMINATED AREA.**
4. Should any leakage be noted:

- a. Retighten headstraps.
- b. Check condition of exhalation valve and seat. Repair if required.

In the event the facepiece CANNOT be adjusted so there is no leakage, DO NOT ENTER THE AREA REQUIRING PROTECTION. Due to your particular facial features, a different style or size Scott facepiece may be required to obtain a proper fit.

#### B. Leak Check

1. Don facepiece without cartridge or filters attached following prescribed method in "Donning Procedures" section for the specific facepiece you are using.
2. After facepiece has been adjusted, close off both inlet connections using palms of hands and follow instructions in 3a, Negative Pressure Leak Check, and 3b, Positive Pressure Leak Check. Do not apply too much pressure otherwise the facepiece may be distorted and cause leakage.
3. a. Negative Pressure Leak Check: inhale slowly and hold breath momentarily. No leakage should be detected and the facepiece should be drawn slightly to the face.  
b. Positive Pressure Leak Check: remove hands from inlet connections, close opening in the exhalation valve guard by placing palm of one hand over face of guard and exhale slowly maintaining slight positive pressure. No leakage should be detected between the facepiece and the face.

4. Should any leakage be noted:

- a. Retighten headstraps.
- b. Check condition of exhalation valve and seat (negative pressure test only).
- c. In the event the facepiece cannot be adjusted so there is no leakage - **DO NOT ENTER THE AREA REQUIRING PROTECTION.** Due to your particular facial features, a different style or size Scott facepiece may be required to obtain a proper facial fit.

## DONNING PROCEDURES

**NOTE:** If the unit is being donned for the first time, refer to appropriate steps listed in "Facepiece Fitting" section. **DURING TRAINING**, the user should determine the tightness of the head harness to provide the best seal, greatest comfort and maximum security for his face.

**A. Half Facepiece Style (Figure 1).**

1. Examine facepiece to be certain it is complete and in serviceable condition.
2. Attach prefilters to cartridges if required, and thread cartridges by turning clockwise until firmly seated against facepiece.
3. Extend the headstraps to ease donning.
4. Pull upper headstrap over forehead, position at the back crown of head and above the ears.
5. Place chin into socket of half facepiece. Hold against face and tighten facepiece to face by alternately pulling on the two upper head harness tabs. The head harness should be positioned above the ears and tightened until a comfortable fit and seal are attained.
6. Clip lower headstraps together behind head and pull on the two



FIGURE 1



FIGURE 2

head harness tabs positioned below the ears until a comfortable fit and seal are attained.

7. Before proceeding with use, a positive or negative leak check is recommended.

**B. Scott-O-Vista® Full Facepiece Style (Figure 2).**

1. Examine facepiece to be certain it is complete and in serviceable condition.
2. Attach prefilters to cartridges if required, and thread cartridges onto facepiece by turning clockwise until firmly seated against gaskets.
3. With head strap adjusted to a full outward position, hold the head harness out of the way with one hand or fold back over the visor.
4. Place the facepiece on the face with the chin properly located in the chin pocket.
5. Pull the head harness over the head and tighten the neck straps by pulling on the two strap ends.
6. Stroke the head harness down to the back several times using one or both hands.
7. Retighten neck straps as required.
8. Before proceeding with use, a positive or negative leak check is recommended.

## USE/DURATION

For maximum use concentrations, read the label on the respirator carton. Read the complete cartridge label and, where applicable, the complete filter label to be certain you are using the correct cartridges and/or filters. When used for protection against substances not specifically mentioned on labels, follow your company guidelines or consult the regulations of the Department of Labor; or contact your nearest OSHA regional office.

The length of time a cartridge or filter, or combination cartridge/filter, will provide protection depends on the conditions of use. The detection of the characteristic odor, or taste, or eye irritation, etc. of the contaminant or an increase in breathing resistance may indicate that protection is exhausted. **RETURN TO FRESH AIR IMMEDIATELY AND REPLACE CARTRIDGES AND/OR FILTERS.** Be certain they are the correct type and make sure all connections are airtight. Dispose of expended filters and cartridges in the manner recommended for that particular contaminant.

Even when these signs of exhausted cartridges are not noticed, Scott recommends changing cartridges daily (after each work shift). Filters should be replaced when an increase in breathing resistance is noted. Removable prefilters may require replacement more frequently than chemical cartridges.

## SNAP-ON FILTER REPLACEMENT

Note Figure 3 and become familiar with the three parts in each assembly and the relationship of the parts.

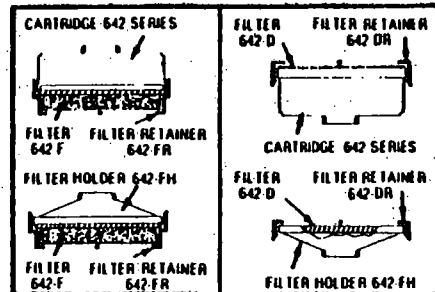


FIGURE 3

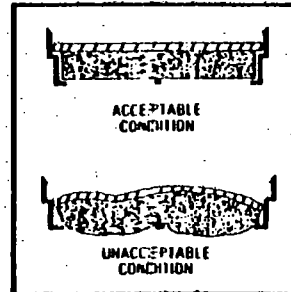


FIGURE 4

- A. Replacing Stock Number 642-F, dust/fume/mist, paint spray or pesticide filter on either cartridge or filter holder.

### TO REMOVE EXPENDED FILTER (Figure 5)

Firmly hold cartridge or filter holder in one hand. Use thumb of other hand to collapse filter retainer (642-FR) wall, while using fingertips to pry filter retainer away from cartridge or filter holder. Dispose of expended filter in the method recommended for that particular contaminant.

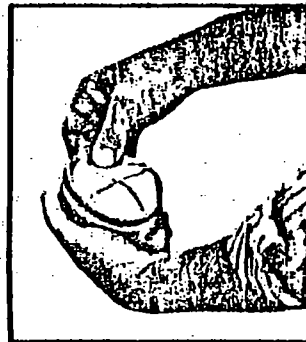


FIGURE 5

### TO INSTALL FILTER

Examine the filter retainer and clean if necessary. If torn or damaged, replace it. Properly place filter into filter retainer as shown in Figure 4, and place it on a flat surface as shown in Figure 3. Press downward on cartridge or filter holder until properly en-

- B Replacing Stock Number 642-D dust/mist filter on cartridge or filter holder.

### TO REMOVE EXPENDED FILTER (Figure 6)

Firmly hold cartridge or filter holder in one hand. Use fingertips of other hand to pry filter retainer 642-DR away from cartridge or filter holder. Dispose of expended filter in the method recommended for that particular contaminant.

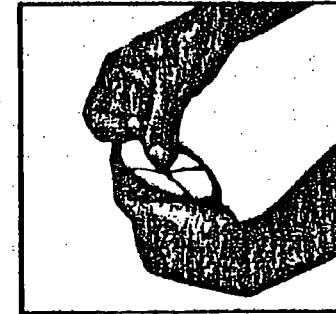


FIGURE 6

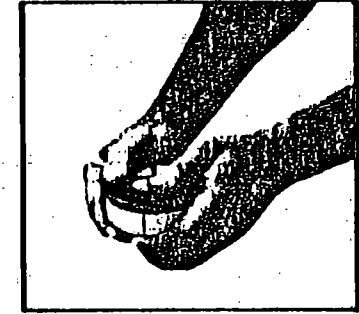


FIGURE 7

### TO INSTALL FILTER

Examine the filter retainer and clean if necessary. If torn or damaged, replace it. Place filter inside the rim of cartridge or filter holder as shown in Figure 3. Pick up cartridge or filter holder, and position filter retainer over one edge. Starting at this edge, use thumbs of both hands as shown in Figure 7, to work retainer over rim until completely seated.

## INSPECTION, CLEANING AND STORAGE

Inspect the equipment for worn or aging rubber parts or damaged components before and after each use and during cleaning.

Replace worn or damaged parts immediately. Use only the manufacturer's replacement parts.

If in good condition, the facepiece (with cartridges and filters removed) should be washed after each use with warm water (max. temp. 110°F) and a mild detergent.

Disinfect the facepiece. (Disinfecting may not be necessary if the respirator is re-used by the same worker.) Disinfectant solutions may be purchased or made from readily available household materials, such as the following:

**Hypochlorite solution (50 ppm of chlorine):** Add approximately two (2) tablespoons of chlorine bleach per gallon of water.

**Aqueous solution of iodine (50 ppm of iodine):** Add approximately one (1) teaspoon of tincture of iodine per gallon of water.

Immerse for two (2) minutes. Rinse thoroughly with clean water to remove all traces of detergent, cleaner or disinfectant, and hang upside down to dry. Take care not to damage the facepiece.

After cleaning and drying, place facepiece in heat-sealed or resealable plastic bag until reissue. Store in a single layer with the facepiece and exhalation valve in a more or less normal position to prevent the rubber or plastic from taking a permanent, distorted "set."

# Ultra-Twin™

## respirator

**CAUTION:** Examine all mask parts, connections and fittings for leakage and wear. Replace exhausted cartridges and any worn or damaged parts immediately.

### FITTING THE MASK

Pull out headband straps, especially the "FRONT" or forehead straps, so that their ends are at the buckles, then grip facepiece between thumb and fingers. Insert chin well into the lower part of facepiece and pull headbands back over head. To obtain a firm and comfortable fit against the face at all points, adjust headbands as follows:

- (a) See that straps lie flat against head.
- (b) Tighten lower or "Neck" straps.
- (c) Tighten the "SIDE" straps. (Do not touch forehead or "FRONT" strap.)
- (d) Place both hands on headband pad and push it towards the neck.
- (e) Repeat operations (b) and (c).
- (f) Tighten forehead or "FRONT" strap a few notches if necessary.

### TEST FOR TIGHTNESS

THE FACEPIECE MUST BE SUBJECTED TO THE FOLLOWING TIGHTNESS TEST BEFORE EACH USE.

Test respirator for leakage, using a positive pressure method. Remove exhalation valve cover and hold rubber valve against seat. Create a slight positive pressure inside face cushion by exhaling. If any leakage is detected around the facial seal, readjust head harness straps and repeat test until there is no leakage. If other than facial seal leakage is detected, the condition must be investigated and corrected before another test is made. The facepiece must pass the tightness test before the user should attempt to enter any toxic atmosphere. The mask will not furnish protection unless all inhaled air is drawn through suitable cartridges. Replace valve cover after completion of test.

### REPLACING CARTRIDGES

When odors of vapors or gases become noticeable or when breathing resistance becomes excessive, it is a sign that the cartridges or filters have served their useful life and should be replaced.

To replace cartridges proceed as follows:

- a. Remove the expended cartridges and discard.
- b. Remove the replacement cartridges from storage bags and insert into the threaded receptacles making sure gaskets are in place in the cartridge holders.
- c. Hand tighten the cartridges with CAUTION to prevent damage to threads and to insure a good seal against the gaskets.

To replace type "F" filters proceed as follows:

- a. Remove the snap type filter covers and discard filters.
- b. Replace a new appropriate filter into each filter cover. Never load filters into the receptacles.
- c. Replace filter covers with CAUTION so as to prevent damage to the filters.

### CLEANING AND SANITIZING

The facepiece (with the cartridges removed) should be cleaned and sanitized after every use with MSA® Cleaner-Sanitizer, Part No. 34337.

1. Simply add one package of powdered MSA Cleaner-Sanitizer to a gallon of warm water (about 120°F.).
2. Immerse soiled equipment in the solution and scrub gently with a soft brush until clean. Take care to clean the exhalation valve in the Facepiece and all other parts that exhaled air contacts.
3. Rinse in plain warm water (about 120°F.) and then air dry.

None of the metal, plastic, rubber, leather, cloth, or glass parts will be adversely affected by the cleaning solution.

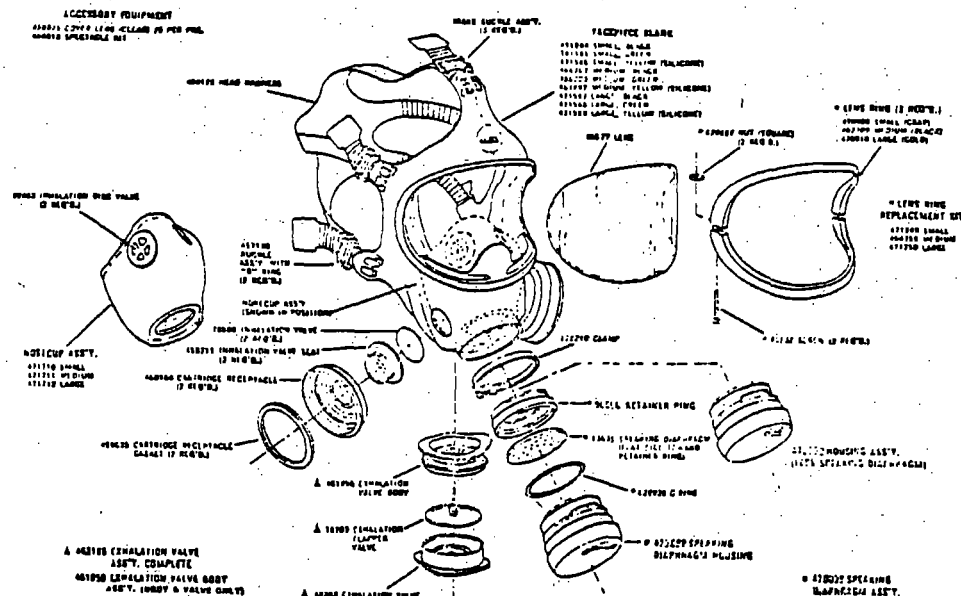
**CAUTION:** Cleaning and Sanitizing at the recommended 120°F. temperature will avoid possible overheating and distortion of parts of the respirator assembly, which would necessitate replacement.

### MAINTENANCE

This mask must be kept in good condition to function properly. When any part shows evidence of failure, it should be replaced immediately with the proper part. Extra parts should be readily available.

This mask when not in use should be stored in a clean dry location.

## Ultra-Twin™ Respirator Components



**CAUTION**

Follow the preceding instructions carefully. They were prepared for your protection.

Do not enter into any atmosphere with this mask unless you KNOW that:

- (a) Cartridges are the proper type for the contaminant or contaminants present.
- (b) Amount of oxygen is sufficient to support life (that is, at least 19.5 percent oxygen by volume at sea level). If oxygen concentration sufficient to support life is questionable, use Self-Contained Breathing Apparatus only.
- (c) Mask does not leak (see test for tightness).
- (d) Cartridges do not need replacing.  
Discard used or exhausted cartridges.

## WARNING

1. This device does NOT supply oxygen.
2. Use only in adequately ventilated areas containing at least 19.5 percent oxygen.
3. Do not use when concentrations of contaminants are unknown or immediately dangerous to life or health.  
[See the respirator NIOSH/MSHA Approval Plate to determine if this device can be used for escape when concentrations of contaminants are unknown or immediately dangerous to life or health.]
4. Leave area immediately if:
  - a. breathing becomes difficult.
  - b. dizziness or other distress occurs.
  - c. you taste or smell contaminant.
5. Use strictly in accordance with instructions, labels and limitations pertaining to this device.
6. This device may not provide a satisfactory face seal with certain physical characteristics (such as beards or gross sideburns) as outlined in ANSI Z88.2 1969, resulting in leakage in connection with the facepiece, which voids or limits the protection. If such a condition exists, the user assumes all risks of death or serious bodily injury which may possibly result.
7. Never alter or modify this device.

**FOR USE BY TRAINED QUALIFIED PERSONNEL ONLY**



# SCOTTORAMIC® FACEPIECE

DONNING PROCEDURE AND MAINTENANCE 801450 & 801500 SERIES



## DONNING PROCEDURE:

1. Adjust the head straps to a full outward position.
2. Hold the head harness out of the way with one hand or fold back over the lens.
3. Place the facepiece on the face with chin properly located in the chin pocket.
4. Pull the head harness over the head and tighten the neck straps by pulling on the two appropriate tabs. PHOTO 1.
5. Stroke the head harness down to the back using one or both hands. PHOTO 2.
6. Tighten the two temple straps. PHOTO 3.
7. Retighten neck straps if required.
8. In most cases, the top head strap will be tight on the "Full out" position.
9. Check the seal by closing off the inhalation tube with your hand and slowly inhale. No leakage should be detected and the facepiece should be drawn onto the face. PHOTO 4.



## NOTE:

In training sessions, each user of the Scottoramic facepiece should determine the general geometry and tightness of the head harness to provide the best seal, greatest comfort and maximum security for each particular facial characteristic.

## MAINTENANCE

The lens in this facepiece is molded of polycarbonate plastic to provide a high degree of impact resistance, optical qualities and dimensional stability.

To replace the lens, remove the 15 clips with a coin or thin pry tool. Align center marks on new lens with facepiece center parting lines. Force lens to bottom of groove in rubber and install clips to retain lens frame.

## CLEANING

Wash in warm soap or detergent solution. Rinse completely in clean warm water and air dry or dry with a soft clean cloth.

Disinfect in 70% ethyl, methyl, or isopropyl alcohol, a quaternary ammonium solution or a hypochlorite solution (50 PPM of chlorine minimum).

## NOTE:

All plastic lenses require care in handling and cleaning. They can be damaged by abrasive or harsh cleaners and softened by some solvents. While most household cleaners, disinfectants and plastic cleaners are satisfactory, it is necessary to first test them on the edge of a lens. Avoid abrasive cleaners, acetone, paint and lacquer thinners, benzene, dry cleaning fluids, strong phenol and cresol solutions. Do not polish with paper towels as most paper contains abrasives. Do not autoclave.

# RECOMMENDED METHOD FOR DONNING THE...

# SCOTT® AIR-PAK® II<sub>a</sub>

*Improper use of this Apparatus in a Hazardous Atmosphere may result in injury or death. Personnel should receive Adequate Training prior to use.*

## BACK-STYLE



Remove Air-Pak from case. Grasp at backplate and cylinder band.



Swing unit up and over head, making sure that elbows extend through loops formed by shoulder straps.



Lean forward, resting unit on back. Buckle chest strap.



Pull down side straps. Return to upright position, snugging unit on back.



Connect and adjust waist belt.



Don Scottoramic® facepiece\*, open cylinder valve and connect breathing hose to regulator.

## SLING-STYLE



Lift Sling-Pak® from carrying case by shoulder strap.



Swing shoulder strap over head while supporting cylinder with left hand.



To adjust, pull shoulder strap while positioning cylinder with left hand.



Snap hook to "D" Ring and adjust waist belt by pulling end.



Don Scottoramic facepiece\*, open cylinder valve and connect breathing hose to regulator.

\*Refer to Scottoramic Facepiece Donning Procedure 89027-00 packaged with every Scottoramic Facepiece.



# SAFETY PRECAUTIONS FOR AIR-PAK® CYLINDERS

Air-Pak cylinders should be recharged as soon as practical after use. Cylinders should not be stored partially charged, for two reasons:

1. If used without recharge, the duration of the apparatus is reduced.
2. The safety relief device is only designed to protect a fully charged cylinder from the effects of a fire.

For maximum safety the cylinders should be stored empty or full.

Prior to recharging, compressed gas cylinders must be examined externally for evidence of high heat exposure, corrosion, or other evidence of significant damage.

## WARNING

CYLINDERS WHICH SHOW EVIDENCE OF EXPOSURE TO HIGH HEAT OR FLAME; e.g., PAINT TURNED TO A BROWN OR BLACK COLOR, DECALS CHARRED OR MISSING, GAUGE LENS MELTED, ELASTOMERIC BUMPER DISTORTED; OR PHYSICAL DAMAGE TO THE CYLINDER SHALL BE REMOVED FROM SERVICE AND RETESTED PRIOR TO RECHARGING.

Additional information of value when performing external and internal inspections of cylinders may be found in CGA Pamphlet C-6, "Standards for Visual Inspection of Compressed Gas Cylinders", available from the Compressed Gas Association, Inc., 500 Fifth Avenue, New York, New York 10036.

If there is any doubt about the suitability of the cylinder for recharge, it shall be returned to a certified hydrostatic test facility for expert examination and retesting.

Scott supplies several types of breathing air cylinders for Air-Pak use. The user must determine specifically which cylinder is to be recharged. All current production Scott Air-Pak cylinders can be categorized into one of the following:

1. Steel type 3AA cylinders that bear a plus (+) sign after the latest retest date may be recharged to a pressure 10% greater than the stamped service pressure, i.e., a cylinder stamped

3AA 2015 with a plus (+) sign after the latest test date may be recharged to 2216 psi. Always check to be sure the hydrostatic retest date is within a five-year period and that the cylinder is properly labeled to indicate air service.

2. Aluminum cylinders bearing Department of Transportation exemption DOT-E6498-2216 may be recharged to 2216 psi. Always check to be sure the hydrostatic retest date is within a five-year period and that the cylinder is properly labeled to indicate air service.

3. Composite cylinders bearing Department of Transportation exemption DOT-E7235-2216 may be recharged to 2216 psi. Always check to be sure the hydrostatic retest date is within a three year period and that the cylinder is properly labeled to indicate air service.

4. Composite cylinders bearing Department of Transportation exemption DOT-E7235-4500 may be recharged to 4500 psi. Always check to be sure the hydrostatic retest date is within a three year period and that the cylinder is properly labeled to indicate air service.

5. Composite (fully wrapped) cylinders bearing Department of Transportation exemption DOT-E8059 4500 may be recharged to 4500 psi. Always check to be sure the hydrostatic retest date is within a three year period and that the cylinder is properly labeled to indicate air service.

Place the cylinder in a suitable container. The container should be constructed to prevent personal injury in the event of problems or component failure while recharging.

Appropriately connect the cylinder to the filling recharge system and refill at a rate less than 1500 psi per minute. Terminate the filling when the pressure reaches service pressure, and allow the cylinder to cool to room temperature. If necessary, top-off the cylinder such that service pressure is attained with the cylinder at a temperature of 70°F. Close the valves on the cylinder and the recharge system and remove the cylinder. Apply a soap solution to determine if there is any leakage between the cylinder and the valve. If there is no leakage, the cylinder is now ready for reuse.

## CAUTION

USE CLEAN DRY AIR IN ACCORDANCE WITH CGA SPECIFICATION G-7.1, TYPE 1, GRADE D OR BETTER.

## PORTABLE OXYGEN UNIT

### TO CONNECT FLOW METER AND MASK:

- Check to see that plastic sealing washer is in place on yoke inlet
- Position regulator yoke over cylinder post valve
- Insert indexing pins on yoke assembly into indexing holes in cylinder post valve
- Tighten T-screw firmly by hand
- Push cannula or mask tubing securely onto oxygen hose nipple fitting

### OPERATION:

- Turn regulator knob counter-clockwise to fully closed position BEFORE opening cylinder valve
- Open cylinder valve SLOWLY
- Check to see if there are any leaks; Be sure the valve is fully open

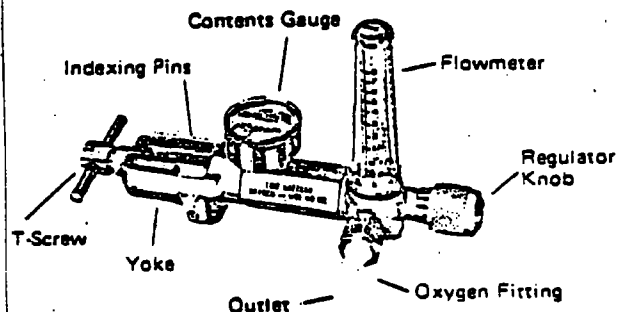
### REMOVAL:

- Do not turn oxygen flow off with regulator knob
- Leave regulator knob in the open position
- Close cylinder valve
- Allow pressure in regulator to drop to zero
- Do not attempt to remove regulator unless the flowmeter indicates zero, and oxygen flow has completely stopped
- Remove regulator from cylinder by reversing installation procedure



#### INSTRUCTIONS FOR USE

Place mask on patient's face. Slip the elastic retaining strap over the head, below the ears and around the back of the neck. Pull the ends gently until the mask fits snugly. It need not be uncomfortably tight. Adjust the metal strip on the nose portion of the mask. Mold it to fit the face. This precludes leakage of oxygen into corners of the eyes. Attach the oxygen supply tube to the oxygen humidifier. Turn the oxygen to prescribed liter flow. That can be varied according to needs.



[illegible]

APPENDIX A

## HAZARDOUS SUBSTANCE INFORMATION

COMMON NAME: TCE

CHEMICAL NAME: Trichloroethylene

## 1. PHYSICAL/CHEMICAL PROPERTIES

Natural Physical State (at 20-25°C): Gas\_\_\_ Liquid X Solid\_\_\_

Molecular Weight: 131

Density: 1.46

Specific Gravity: -

Solubility:Water: 1,000 mg/l @ 20°C

Solubility:Other: Alcohol, Acetone

Boiling Point: 188°F / 87°C

Melting Point: -123°F / -73°C

Vapor Pressure: 58 mmHg @ 68°F

Vapor Density: 4.53

Flash Point (open cup\_\_\_ closed cup\_\_\_): None

Ionization Potential: 9.47 eV

## 2. HAZARDOUS CHARACTERISTICS

## A. TOXICOLOGICAL HAZARD

PERMISSIBLE CONCENTRATION (PPM)

Inhalation	<u>X</u>	<u>PEL-TWA:100 (200 ceil.); TLV:50</u>
Ingestion	<u>X</u>	_____
Skin/Eye Abs	_____	_____
Skin/Eye Cont	<u>X</u>	_____
Carcinogenic	<u>X</u>	_____
Teratogenic	_____	_____
Mutagenic	<u>X</u>	_____
Other	_____	_____

Combustibility X Autoignite \_\_\_\_\_

Toxic Byproducts \_\_\_\_\_

Flammability LFL 12.5% UFL 90%Explosivity LEL 11.0% UEL 41%

## HAZARDOUS SUBSTANCE INFORMATION

COMMON NAME: Vinyl Chloride

CHEMICAL NAME: Chloroethane

## 1. PHYSICAL/CHEMICAL PROPERTIES

Natural Physical State (at 20-25°C): Gas X Liquid    Solid   

Molecular Weight: 63

Density: 0.9106

Specific Gravity: -

Solubility:Water: Slightly

Solubility:Other: Alcohol, Ether

Boiling Point: 70°F / -13.37 °C

Melting Point: -245°F / -153.8°C

Vapor Pressure: 2580 mmHg @ 68°F

Vapor Density: 2.15

Flash Point (open cup    closed cup X): -108°F / -77.8°C

Ionization Potential: 9.995 eV

## 2. HAZARDOUS CHARACTERISTICS

## A. TOXICOLOGICAL HAZARD

PERMISSIBLE CONCENTRATION (PPM)

Inhalation	<u>X</u>	<u>PEL-TWA:1; TLV-TWA:5</u>
Ingestion	<u>  </u>	<u>  </u>
Skin/Eye Abs	<u>X</u>	<u>  </u>
Skin/Eye Cont	<u>X</u>	<u>Severe irritant/burns</u>
Carcinogenic	<u>X</u>	<u>  </u>
Teratogenic	<u>  </u>	<u>  </u>
Mutagenic	<u>X</u>	<u>  </u>
Other	<u>  </u>	<u>  </u>

Combustibility X Autoignite: 472°CToxic Byproducts HCl, Phosgene, COExplosivity LEL 3.6% UEL 33%



# HAZARDOUS SUBSTANCE INFORMATION

COMMON NAME: Chloroethane

CHEMICAL NAME: Ethylchloride

## 1. PHYSICAL/CHEMICAL PROPERTIES

Natural Physical State (at 20-25°C): Gas X Liquid X Solid   

Molecular Weight: 65

Density: -

Specific Gravity: 0.8978 @ 20°C

Solubility:Water: 5740 mg/l @ 20°C

Solubility:Other: Alcohol, Ether

Boiling Point: 54°F / 12.3°C

Melting Point: -218°F / -136°C

Vapor Pressure: 1,000 mmHg @ 20°C

Vapor Density: 2.23

Flash Point (open cup    closed cup X): -58°F

Ionization Potential: 10.97 eV

## 2. HAZARDOUS CHARACTERISTICS

### A. TOXICOLOGICAL HAZARD

#### PERMISSIBLE CONCENTRATION (PPM)

Inhalation	<u>X</u>	<u>PEL-TWA:1000; IDLH:20,000</u>
Ingestion	<u>X</u>	<u>  </u>
Skin/Eye Abs	<u>X</u>	<u>  </u>
Skin/Eye Cont	<u>X</u>	<u>  </u>
Carcinogenic	<u>  </u>	<u>  </u>
Teratogenic	<u>  </u>	<u>  </u>
Mutagenic	<u>  </u>	<u>  </u>
Other	<u>  </u>	<u>  </u>

Combustibility X Autoignite: 966°F / 519°C

Toxic Byproducts Phosgene, HCl, CO

Explosivity LEL 3.8% UEL 15.4%

## HAZARDOUS SUBSTANCE INFORMATION

COMMON NAME: Methylene Chloride

CHEMICAL NAME: Dichloromethane

### 1. PHYSICAL/CHEMICAL PROPERTIES

Natural Physical State (at 20-25°C): Gas\_\_\_ Liquid X Solid\_\_\_

Molecular Weight: 85

Density: 1.33 @ 20°C

Specific Gravity: -

Solubility:Water: 20,000 mg/l @ 20°C

Solubility:Other: Alcohol, Ether

Boiling Point: 104°F / 40°C

Melting Point: -142°F / -97°C

Vapor Pressure: 350 mmHg @ 20 °C

Vapor Density: 2.93

Flash Point (open cup\_\_\_ closed cup\_\_\_):

Ionization Potential: 11.35 eV

### 2. HAZARDOUS CHARACTERISTICS

#### A. TOXICOLOGICAL HAZARD

##### PERMISSIBLE CONCENTRATION (PPM)

Inhalation	<u>X</u>	<u>PEL-TWA:500; TLV:100</u>
Ingestion	<u>X</u>	_____
Skin/Eye Abs	_____	_____
Skin/Eye Cont	<u>X</u>	_____
Carcinogenic	<u>X</u>	_____
Teratogenic	_____	_____
Mutagenic	_____	_____
Other	_____	_____

Combustibility X Autoignite: 1033°F / 556°C

Toxic Byproducts HCl, Phosgene, CO

Explosivity LEL 12% UEL 19%

## HAZARDOUS SUBSTANCE INFORMATION

COMMON NAME: Acetone

CHEMICAL NAME: 2-Propanone

## 1. PHYSICAL/CHEMICAL PROPERTIES

Natural Physical State (at 20-25°C): Gas\_\_\_ Liquid X Solid\_\_\_

Molecular Weight: 58

Density: -

Specific Gravity: 0.7899 @ 20°C

Solubility: Water: Miscible

Solubility: Other: -

Boiling Point: 133°F / 56°C

Melting Point: -169°F / -95°C

Vapor Pressure: 266 mmHg @ 77°F

Vapor Density: 2.0

Flash Point (open cup\_\_\_ closed cup X): 1.4°F

Ionization Potential:

## 2. HAZARDOUS CHARACTERISTICS

## A. TOXICOLOGICAL HAZARD

PERMISSIBLE CONCENTRATION (PPM)

Inhalation	<u>X</u>	<u>PEL-TWA:1000; TLV:750; IDLH:20,000</u>
Ingestion	<u>X</u>	_____
Skin/Eye Abs	_____	_____
Skin/Eye Cont	<u>X</u>	_____
Carcinogenic	_____	_____
Teratogenic	_____	_____
Mutagenic	_____	_____
Other	_____	_____

Combustibility \_\_\_\_\_ Autoignite \_\_\_\_\_

Toxic Byproducts \_\_\_\_\_

Explosivity LEL 2.6% UEL 12.8%

## HAZARDOUS SUBSTANCE INFORMATION

COMMON NAME: Methyl Ethyl Ketone/MEK

CHEMICAL NAME: 2-Butanone

### 1. PHYSICAL/CHEMICAL PROPERTIES

Natural Physical State (at 20-25°C): Gas\_\_\_ Liquid X Solid\_\_\_

Molecular Weight: 72

Density: -

Specific Gravity: 0.805 @ 20°C

Solubility:Water: Very Soluble

Solubility:Other: Alcohol, Ether, Benzene

Boiling Point: 175°F / 79.6°C

Melting Point: -123°F / -86.4°C

Vapor Pressure: 71.2 mmHg @ 20°C

Vapor Density: 2.41

Flash Point (open cup\_\_\_ closed cup X): 21°F

Ionization Potential: 9.48 eV

### 2. HAZARDOUS CHARACTERISTICS

#### A. TOXICOLOGICAL HAZARD

##### PERMISSIBLE CONCENTRATION (PPM)

Inhalation	<u>X</u>	<u>PEL-TWA:200; IDLH:3000</u>
Ingestion	<u>X</u>	_____
Skin/Eye Abs	_____	_____
Skin/Eye Cont	<u>X</u>	_____
Carcinogenic	_____	_____
Teratogenic	_____	_____
Mutagenic	_____	_____
Other	_____	_____

Combustibility \_\_\_\_\_ Autoignite: 516°C

Toxic Byproducts \_\_\_\_\_

Explosivity LEL 2% UEL 10%

## HAZARDOUS SUBSTANCE INFORMATION

COMMON NAME: 1,1-Dichloroethene

CHEMICAL NAME: Vinylidene chloride

### 1. PHYSICAL/CHEMICAL PROPERTIES

Natural Physical State (at 20-25°C): Gas\_\_\_ Liquid X Solid\_\_\_

Molecular Weight: 97

Density: 1.218

Specific Gravity: -

Solubility:Water: 400 mg/l @ 20°C

Solubility:Other: Alcohol, Ether

Boiling Point: 37°C

Melting Point: -122°C

Vapor Pressure: 500 mmHg @ 20°C

Vapor Density: 3.25

Flash Point (open cup\_\_\_ closed cup\_\_\_):

Ionization Potential:

### 2. HAZARDOUS CHARACTERISTICS

#### A. TOXICOLOGICAL HAZARD

##### PERMISSIBLE CONCENTRATION (PPM)

Inhalation	<u>X</u>	_____
Ingestion	<u>X</u>	_____
Skin/Eye Abs	_____	_____
Skin/Eye Cont	_____	_____
Carcinogenic	<u>X</u>	_____
Teratogenic	_____	_____
Mutagenic	<u>X</u>	_____
Other	_____	_____

Combustibility \_\_\_\_\_ Autoignite \_\_\_\_\_

Toxic Byproducts \_\_\_\_\_

Flammability LFL \_\_\_\_\_ UFL \_\_\_\_\_

Explosivity LEL \_\_\_\_\_ UEL \_\_\_\_\_

## HAZARDOUS SUBSTANCE INFORMATION

COMMON NAME: 1,1-Dichloroethane

CHEMICAL NAME: Ethylidene chloride

### 1. PHYSICAL/CHEMICAL PROPERTIES

Natural Physical State (at 20-25°C): Gas\_\_\_ Liquid X Solid\_\_\_

Molecular Weight: 99

Density: -

Specific Gravity: 1.174 @ 20°C

Solubility:Water: 5,000 mg/l

Solubility:Other: Alcohol (miscible)

Boiling Point: 135°F / 57.3°C

Melting Point: -142°F / -97.4°C

Vapor Pressure: 180 mmHg @ 20°C

Vapor Density: 3.42

Flash Point (open cup\_\_\_\_\_ closed cup X): 17°F / -8.5°C

Ionization Potential:

### 2. HAZARDOUS CHARACTERISTICS

#### A. TOXICOLOGICAL HAZARD

##### PERMISSIBLE CONCENTRATION (PPM)

Inhalation	<u>X</u>	<u>PEL-TWA:100; IDLH:4000</u>
Ingestion	<u>X</u>	_____
Skin/Eye Abs	_____	_____
Skin/Eye Cont	<u>X</u>	_____
Carcinogenic	_____	_____
Teratogenic	_____	_____
Mutagenic	_____	_____
Other	_____	_____

Combustibility \_\_\_\_\_ Autoignite \_\_\_\_\_

Toxic Byproducts \_\_\_\_\_

Explosivity LEL 6% UEL 16%

## HAZARDOUS SUBSTANCE INFORMATION

COMMON NAME: 1,2-Dichloroethene

CHEMICAL NAME: Acetylene dichloride

### 1. PHYSICAL/CHEMICAL PROPERTIES

Natural Physical State (at 20-25°C): Gas\_\_\_ Liquid X Solid\_\_\_

Molecular Weight: 97

Density: -

Specific Gravity: 1.27 @ 20°C

Solubility: Water: 650 mg/l @ 20°C

Solubility: Other: -

Boiling Point: 113 to 140°F

Melting Point: -56 to -115°F

Vapor Pressure: 180 to 265 mmHg @ 20°C

Vapor Density: 3.34

Flash Point (open cup\_\_\_ closed cup X): 39°F / 3.9°C

Ionization Potential: 9.65 eV

### 2. HAZARDOUS CHARACTERISTICS

#### A. TOXICOLOGICAL HAZARD

##### PERMISSIBLE CONCENTRATION (PPM)

Inhalation	<u>X</u>	<u>PEL-TWA: 200</u>
Ingestion	<u>X</u>	_____
Skin/Eye Abs	_____	_____
Skin/Eye Cont	<u>X</u>	_____
Carcinogenic	_____	_____
Teratogenic	_____	_____
Mutagenic	_____	_____
Other	_____	_____

Combustibility X Autoignite: 860°F / 460°C

Toxic Byproducts HCl, Phosgene, CO

Explosivity LEL 9.7% UEL 12.8%

## HAZARDOUS SUBSTANCE INFORMATION

COMMON NAME: 1,1,1-Trichloroethane      CHEMICAL NAME: Methyl chloroform

### 1. PHYSICAL/CHEMICAL PROPERTIES

Natural Physical State (at 20-25°C): Gas\_\_\_ Liquid X Solid\_\_\_

Molecular Weight: 133

Density: -

Specific Gravity: 1.34 @ 20 °C

Solubility:Water: 480 to 4800 mg/l @ 20 °C

Solubility:Other: Acetone, Benzene

Boiling Point: 165°F / 74.1 °C

Melting Point: -36°F / -30.4 °C

Vapor Pressure: 123 mmHg @ 20 °C

Vapor Density: 4.63

Flash Point (open cup\_\_\_ closed cup\_\_\_): None

Ionization Potential:

### 2. HAZARDOUS CHARACTERISTICS

#### A. TOXICOLOGICAL HAZARD

#### PERMISSIBLE CONCENTRATION (PPM)

Inhalation	<u>X</u>	<u>PEL-TWA:350; REL:350; IDLH:1000</u>
Ingestion	<u>X</u>	_____
Skin/Eye Abs	<u>X</u>	_____
Skin/Eye Cont	<u>X</u>	_____
Carcinogenic	<u>X</u>	_____
Teratogenic	_____	_____
Mutagenic	<u>X</u>	_____
Other	_____	_____

Combustibility X      Autoignite: 932°F / 500°C

Toxic Byproducts HCl, Phosgene, CO

Explosivity LEL 7%      UEL 16%



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